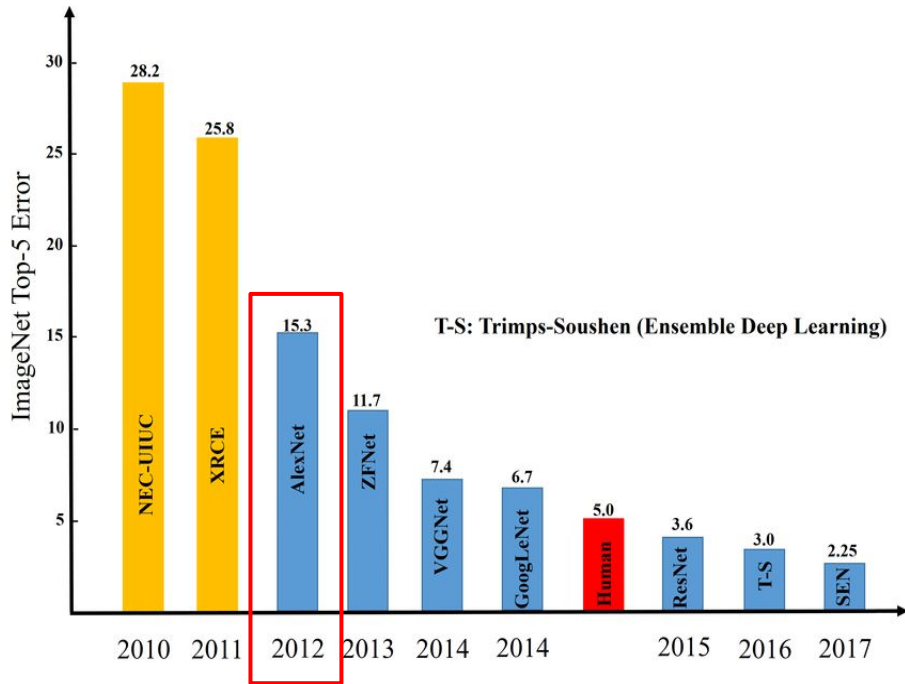


# **ImageNet Classification with Deep Convolutional Neural Networks (AlexNet)**

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2022.02.19

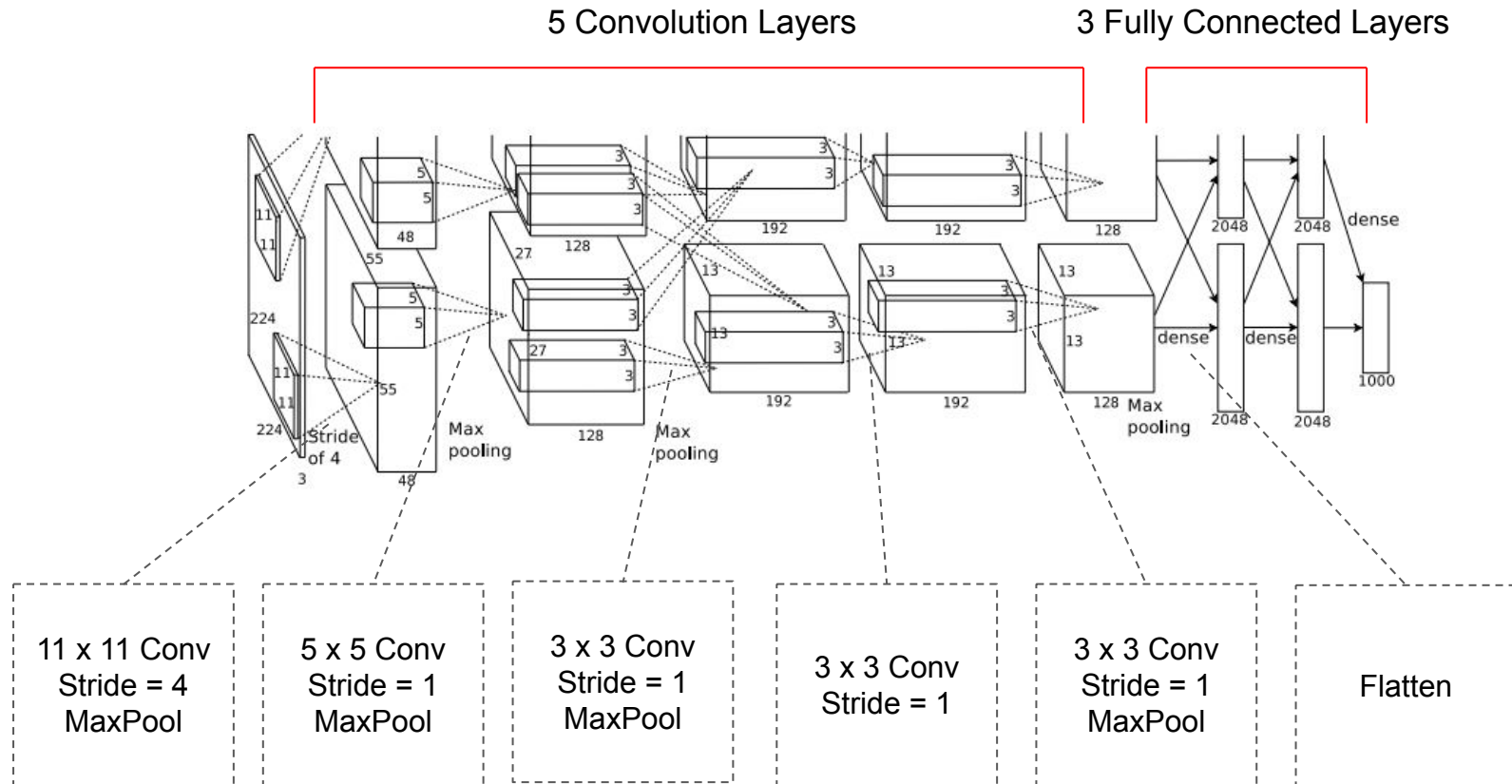
# 1. About AlexNet

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- Won the ILSVRC with 15% error.  
Second top-5 error model was 26.2%
- have spurred many more papers published employing CNN and GPUs to accelerate deep learning.
- Keys to success compared to past CNN (LeNet) network.

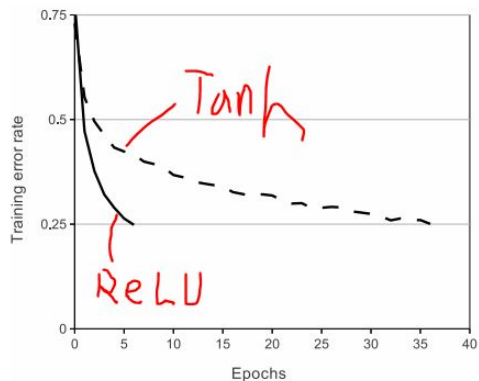
## 2. AlexNet Architecture



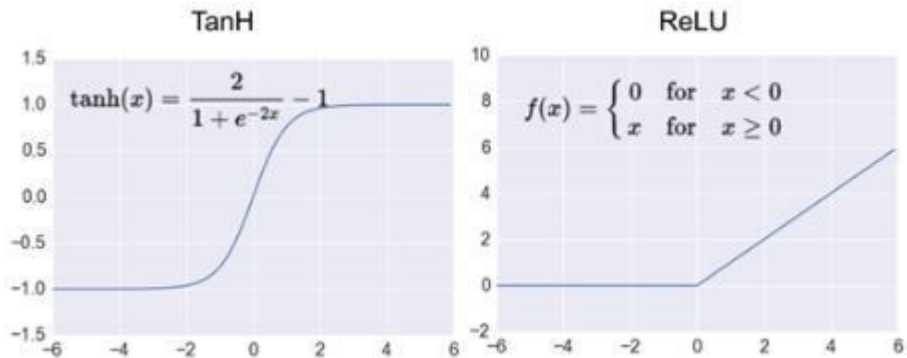
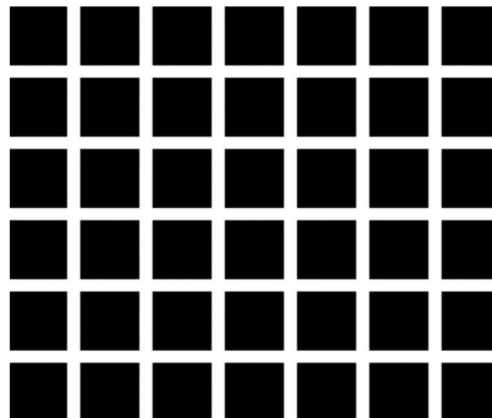
### 3. What's Special?

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#### 1) ReLu Nonlinearity

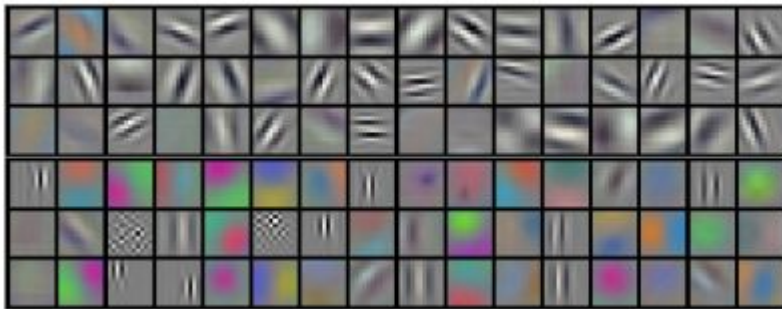
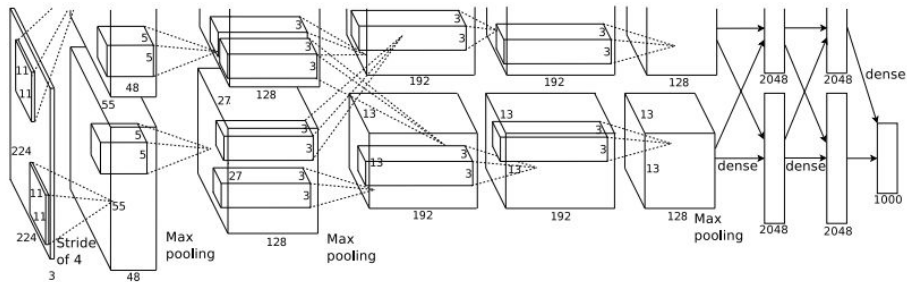


#### 2) Local Response Normalization (LRN)



### 3. What's Special?

#### 3) Training on multiple GPUs



#### 4) Overlapping Pooling

##### Non-overlapping pooling

1	3	5	5
4	1	4	9
3	2	0	1
5	2	4	6



4	9
5	6

Stride 2  
2 x 2 max pooling

##### Overlapping pooling

1	3	5	5
4	1	4	9
3	2	0	1
5	2	4	6



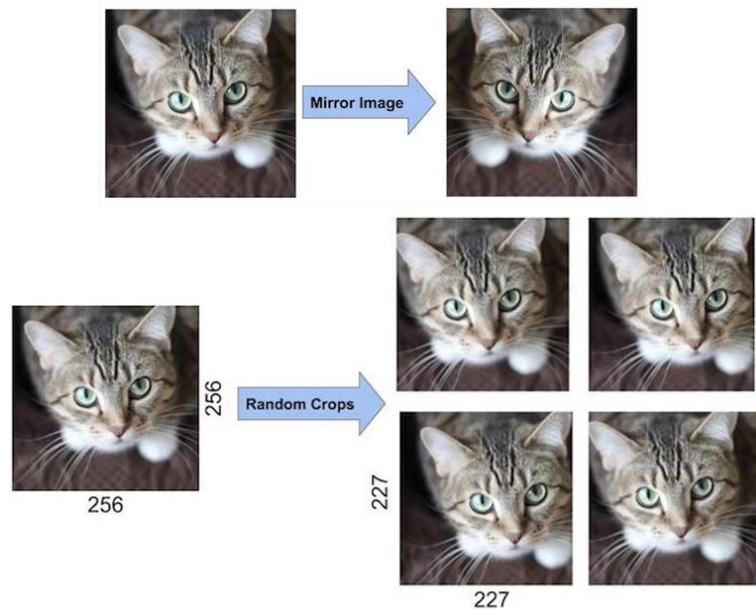
4	5	9
4	4	9
5	4	6

Stride 1  
2 x 2 max pooling

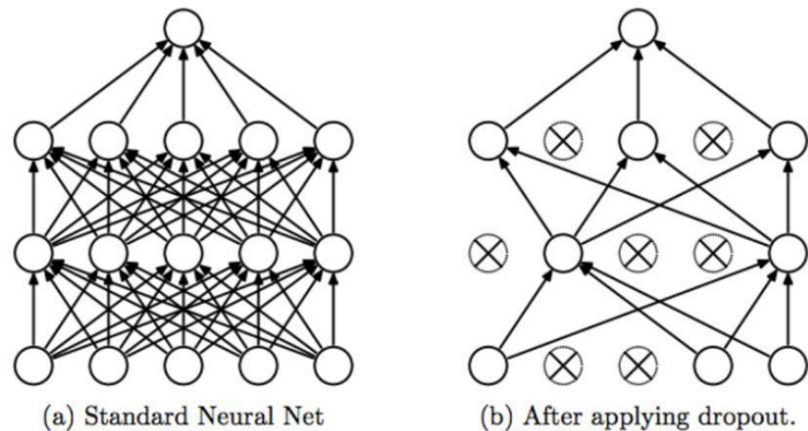
### 3. What's Special?

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#### 5) Data Augmentation



#### 6) Dropout



## 4. References

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- 1) [http://www.cs.toronto.edu/~kriz/imagenet\\_classification\\_with\\_deep\\_convolutional.pdf](http://www.cs.toronto.edu/~kriz/imagenet_classification_with_deep_convolutional.pdf)
- 2) <https://www.datamaker.io/posts/34/>
- 3) <https://deep-learning-study.tistory.com/376>
- 4) <https://bskyvision.com/421>
- 5) <https://towardsdatascience.com/what-alexnet-brought-to-the-world-of-deep-learning-46c7974b46fc>
- 6) <https://www.mygreatlearning.com/blog/alexnet-the-first-cnn-to-win-image-net/>
- 7) <https://towardsdatascience.com/alexnet-the-architecture-that-challenged-cnns-e406d5297951>